IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): An optical amplifying method of an optical amplifier connected to an optical transmission line, the method comprising the steps of[.]:

detecting an optical input and output power of said optical amplifier;

obtaining a difference between a target gain and a measured gain of said optical amplifier ~~and a target gain~~ obtained based on the detected optical input and output power to produce an error signal;

applying said error signal to each of a proportional calculation and an integral calculation to create respective proportional and integral control signals, and adding proportional and integral control signals to create a drive current of at least one pump laser diode provided in said optical amplifier;

controlling the gain of said optical amplifier with the drive current; and

adjusting a control parameter of the proportional calculator in response to the detected optical input power, said control parameter being a proportional constant by which said error signal is multiplied to form said proportional control signal, said proportional constant being represented by a function of the optical input power as a result of the adjusting the control parameter in response to the detected optical input power.

Claims 2-3 (Canceled):

Claim 4 (Currently Amended): The optical amplifying method as claimed in claim 1, wherein said step of adjusting ~~a~~ the control parameter includes adjusting ~~a~~ the control parameter in response to a detected variation in optical input power resulting from adding or dropping an optical signal in a connected wavelength division multiplexing device.

Claims 5-32 (Cancelled):

Claim 33 (Currently Amended): An optical amplifier connected to an optical transmission line, comprising:

means for detecting an optical input and output power of said optical amplifier;

means for obtaining a difference between a target gain and a measured gain of said optical amplifier ~~and a target gain~~ obtained based on the detected optical input and output power to produce an error signal;

means for applying said error signal to each of a proportional calculation and an integral calculation to create respective proportional and integral control signals;

means for adding the proportional and integral control signals to create a drive current of at least one pump laser diode provided in said optical amplifier;

means for controlling the gain of said optical amplifier with the drive current; and

means for adjusting a control parameter of the proportional calculator in response to the detected optical input power, said control parameter being a proportional constant by which said error signal is multiplied to form said proportional control signal, said proportional constant being represented by a function of the optical input power as a result of the adjusting the control parameter in response to the detected optical input power.

Claim 34 (Currently Amended): The optical amplifier as claimed in claim 33, wherein said means for adjusting ~~a~~ the control parameter includes means for adjusting the control parameter in response to a detected variation in optical input power resulting from adding or dropping an optical signal in a connected wavelength division multiplexing device.

Claim 35 (Currently Amended): An optical amplifier connected to an optical transmission line, comprising:

a detector configured to detect an optical input power of said optical amplifier;

a detector configured to detect an optical output power of said optical amplifier;

a difference calculator configured to calculate a difference between a target gain and a measured gain of said optical amplifier ~~and a target gain~~ obtained based on the detected optical input and output power to produce an error signal;

a proportional calculator and an integral calculator each configured to operate on said error signal to create respective proportional and integral control signals;

an adder configured to add the proportional and integral control signals to create a drive current of at least one pump laser diode provided in said optical amplifier;

a gain controller configured to control the gain of said optical amplifier with the drive current; and

a gain control adjuster configured to adjust a control parameter of the proportional calculator in response to the detected optical input power, said control parameter being a proportional constant by which said error signal is multiplied to form said proportional control signal, said proportional constant being represented by a function of the optical input power as a result of the adjusting the control parameter in response to the detected optical input power.

Claim 36 (Currently Amended): The optical amplifier as claimed in ~~claim 34~~ claim 35, wherein said gain control adjuster includes an adjuster configured to adjust the control parameter in response to a detected variation in optical input power resulting from adding or dropping an optical signal in a connected wavelength division multiplexing device.

Claim 37 (Currently Amended): An optical signal distribution system, comprising:

a first optical signal source;

the optical amplifier recited in ~~one of claims 35-36~~claim 35; and

an optical fiber connecting the optical signal source and the optical amplifier.

Claim 38 (Previously Presented): The optical signal distribution system as claimed in claim 37, further comprising:

a second optical source;

a wavelength division multiplexer connecting the first and second optical sources to the optical fiber.

Claim 39 (Previously Presented): The optical amplifying method of claim 1, wherein the control parameter of the proportional calculator is increased according to an increase of optical input power.

Claim 40 (Previously Presented): The optical amplifier of claim 33, wherein the control parameter of the proportional calculator is increased according to the increase of optical input power.

Claim 41 (Previously Presented): The optical amplifier of claim 35, wherein the control parameter of the proportional calculator is increased according to the increase of optical input power.